



CLEAN CLAIMS

Ser. No. 09/347,438  
Art Unit 2153 (Burgess)  
Docket No. 50325-0074

#10  
01/07/03

Amel/B

1 1. (Amended) A method of selectively establishing a quality of service value for  
2 a particular network device in a network that comprises a plurality of other  
3 heterogeneous network devices, comprising the steps of:  
4 receiving application information that defines one or more traffic flows associated  
5 with one or more message types generated by an application program,  
6 including information identifying one or more points at which an  
7 application generates the traffic flows;  
8 receiving device information that defines one of more quality of service  
9 treatments that the particular network device may apply to data processed  
10 by the particular network device;  
11 based on the device information and the application information, determining one  
12 or more processing policies that associate the traffic flows with the quality  
13 of service treatments;  
14 creating and storing one or more mappings of the application points to the quality  
15 of service treatments that may be used with the processing policies to  
16 generate the quality of service value when the application program  
17 generates traffic flows of one of the message types.

1 2. (Amended) A method as recited in Claim 1, further comprising:  
2 storing the mappings in a repository that is accessible by the application program;  
3 storing both the application information and the device information in the  
4 repository;  
5 converting the mappings into one or more settings of the network device;  
6 enforcing one of the processing policies at the network device in response to  
7 receiving traffic from the application program that matches the traffic flow  
8 type.

1 3. (Amended) A method as recited in Claim 1, further comprising:  
2 creating and storing one or more classes that classify the traffic flows, each of the  
3 classes associated with one or more of the message types;

*CE/H  
B1*  
4 based on the device information and the classes of the traffic flows, determining  
5 one or more processing policies that associate the traffic flows with the  
6 quality of service treatments.

*B2*  
1 4. A method as recited in Claim 1, wherein receiving application information  
2 comprises receiving one or more application code points that represent traffic  
3 flow types.

1 ✓ 5. (Canceled)

1 6. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings comprises creating and storing one or more policies, concerning  
3 network processing of traffic flows generated by the application program, in the  
4 repository.

1 7. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings comprises creating and storing one or more policies, concerning  
3 network processing of traffic flows generated by the application program, in a  
4 policy store that is coupled to the repository.

1 8. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings comprises creating and storing one or more policies, concerning  
3 network processing of traffic flows generated by the application program, in a  
4 directory.

1 9. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings comprises creating and storing one or more policies, concerning  
3 network processing of traffic flows generated by the application program, in a  
4 policy server coupled to a Lightweight Directory Access Protocol directory that  
5 comprises the repository.

1 10. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings further comprises creating and storing, in the repository, one or more  
3 mappings of Application Code Points of the application program to one or more  
4 Differential Services Code Points of a protocol associated with the network  
5 device.

1 11. A method as recited in Claim 1, wherein creating and storing one or more  
2 mappings further comprises generating one or more messages in RSVP+ () and  
3 communicating the messages to the network device.

---

12. (Amended) A method as recited in Claim 1, wherein receiving application  
information comprises receiving application information that defines one or more  
traffic flows generated by an application program, including information  
identifying one or more points at which an application generates the traffic flows,  
from a first individual having responsibility for managing enterprise applications  
in the network, and not from one having responsibility for managing the network.

13. (Amended) A method as recited in Claim 12, wherein receiving device  
information comprises receiving device information that defines one or more  
quality of service treatments that the network device may apply to data processed  
by the network device, from a second individual having responsibility for  
managing the network.

---

14. A method as recited in Claim 1, wherein determining one or more processing  
policies comprises creating and storing one or more policy statements in a  
repository, wherein each policy statement associates a condition of one of the  
traffic flows, an operator, an operand, and an action comprising one of the quality  
of service treatments.

1 15. A method as recited in Claim 1, wherein determining one or more processing  
2 policies comprises creating and storing one or more policy statements in a  
3 repository, wherein each policy statement is represented by a plurality of nodes  
4 that represent a condition of one of the traffic flows, an operator, an operand, and  
5 an action comprising one of the quality of service treatments.

1 16. A method as recited in Claim 1, wherein determining one or more processing  
2 policies comprises creating and storing one or more policy statements in a  
3 directory, wherein each policy statement is represented by a plurality of nodes  
4 that represent a condition of one of the traffic flows, an operator, an operand, and  
5 an action comprising one of the quality of service treatments, and wherein the  
6 plurality of nodes is coupled to a root node having a distinguished name in the  
7 directory.

1 17. A method as recited in Claim 1, wherein each of the mappings comprises an  
2 application code point value stored in associated with a differentiated services  
3 code point value.

---

1 18. (Amended) A method as recited in Claim 2, wherein enforcing one of the  
2 processing policies comprises:  
3 requesting, using an application QoS policy element that is tightly coupled to the  
4 application program, an operating system function to modify a packet of  
5 the traffic flows using a policy element that requests a different operating  
6 system function according to the operating system then in use;  
7 at the network device, in response to receiving traffic from the application  
8 program that matches the traffic flow type and in response to the operating  
9 system function, modifying the packet to activate a quality of service  
10 treatment of the network device.

1 19. (Amended) A method of selectively establishing a quality of service value  
2 treatment for network traffic passing through a particular device in a data network  
3 that comprises a plurality of other heterogeneous network devices, according to an  
4 application program that generates the network traffic, comprising the steps of:  
5 receiving application information that defines one or more traffic flows associated  
6 with one or more message types generated by the application program,  
7 including one or more application codepoints at which an application  
8 generates the traffic flows;  
9 receiving device information that defines one or more quality of service  
10 treatments that the particular network device is capable of applying to data  
11 processed by the particular network device;  
12 based on the device information and the application information, determining one  
13 or more processing policies that associate the traffic flows with the quality  
14 of service treatments;  
15 creating and storing one or more mappings of the application points to the quality  
16 of service treatments that may be used with the processing policies to  
17 generate the quality of service value when the application program  
18 generates traffic flows of one of the message types;  
19 storing the mappings in a repository that is accessible by the application program;  
20 converting the mappings into one or more messages to the network device that  
21 instruct the network device to apply Differentiated Services quality of  
22 service treatment in response to receiving traffic from the application  
23 program that matches the traffic flows.

1 20. (Amended) A method of selectively establishing a quality of service value for  
2 a particular network device in a network that comprises a plurality of other  
3 heterogeneous network devices, comprising the steps of:  
4 receiving application information that defines one or more traffic flows associated  
5 with one or more message types generated by an application program,

6 including information identifying one or more points at which an  
7 application generates the traffic flows;  
8 receiving device QoS information that defines one or more quality of service  
9 treatments that the particular network device may apply to data processed  
10 by the particular network device;  
11 based on the device QoS information and the application information,  
12 determining one or more processing policies that associate the traffic  
13 flows with the quality of service treatments;  
14 creating and storing one or more mappings of the application points to the quality  
15 of service treatments that may be used with the processing policies to  
16 generate the quality of service value when the application program  
17 generates traffic flows for one of the message types.

1 21. (Amended) A computer-readable medium carrying one or more sequences of  
2 instructions which, when executed by one or more processors, cause the one or  
3 more processors to selectively establish a quality of service value for a particular  
4 network device in a network that comprises a plurality of other heterogeneous  
5 network devices, by carrying out the steps of:  
6 receiving application information that defines one or more traffic flows associated  
7 with one or more message types generated by an application program,  
8 including information identifying one or more points at which an  
9 application generates the traffic flows;  
10 receiving device information that defines one or more quality of service  
11 treatments that the particular network device may apply to data processed  
12 by the particular network device;  
13 based on the device information and the application information, determining one  
14 or more processing policies that associate the traffic flows with the quality  
15 of service treatments;  
16 creating and storing one or more mappings of the application points to the quality  
17 of service treatments that may be used with the processing policies to

18 generate the quality of service value when the application program  
19 generates traffic flows for one of the message types.

1 22. (Amended) A computer-readable medium as recited in Claim 21, further  
2 comprising instructions for carrying out the steps of:  
3 storing the mappings in a repository that is accessible by the application program;  
4 storing both the application information and the device information in the  
5 repository;  
6 converting the mappings into one or more settings of the network device;  
7 enforcing one of the processing policies at the network device in response to  
8 receiving traffic from the application program that matches the traffic flow  
9 type.

*Cont. pvt*

1 23. (Amended) A computer-readable medium as recited in Claim 21, further  
2 comprising instructions for carrying out the steps of:  
3 creating and storing one or more classes that classify the traffic flows, each of the  
4 classes associated with one or more of the message types;  
5 based on the device information and the classes of the traffic flows, determining  
6 one or more processing policies that associate the traffic flows with the  
7 quality of service treatments.

1 24. A computer-readable medium as recited in Claim 21, further comprising  
2 instructions for carrying out the steps of creating and storing one or more  
3 mappings by creating and storing one or more policies, concerning network  
4 processing of traffic flows generated by the application program, in the  
5 repository.

1 25. A computer-readable medium as recited in Claim 21, further comprising  
2 instructions for carrying out the steps of creating and storing one or more  
3 mappings by creating and storing one or more policies, concerning network  
4 processing of traffic flows generated by the application program, in a policy

5 server coupled to a Lightweight Directory Access Protocol directory that  
6 comprises the repository.

1 26. A computer-readable medium as recited in Claim 21, further comprising  
2 instructions for carrying out the steps of creating and storing one or more  
3 mappings by creating and storing, in the repository, one or more mappings of  
4 Application Code Points of the application program to one or more Differential  
5 Services Code Points of a protocol associated with the network device.

1 27. A computer-readable medium as recited in Claim 21, further comprising  
2 instructions for carrying out the steps of determining one or more processing  
3 policies by creating and storing one or more policy statements in a repository,  
4 wherein each policy statement associates a condition of one of the traffic flows,  
5 an operator, an operand, and an action comprising one of the quality of service  
6 treatments.

1 28. A computer-readable medium as recited in Claim 1, further comprising  
2 instructions for determining one or more processing policies by creating and  
3 storing one or more policy statements in a directory, wherein each policy  
4 statement is represented by a plurality of nodes that represent a condition of one  
5 of the traffic flows, and operator, an operand, and an action comprising one of the  
6 quality of service treatments, and wherein the plurality of nodes is coupled to a  
7 root node having a distinguished name in the directory.

1 29. (New) A method of selectively establishing a quality of service value for a  
2 particular network device in a network that comprises a plurality of other  
3 heterogeneous network devices, comprising the steps of:  
4 receiving and storing, in a directory server, application information that defines  
5 one or more traffic flows for one or more message types generated by an  
6 application program, including information identifying one or more code  
7 points at which an application generates the traffic flows;

8 receiving and storing, in the directory server, device information that defines one  
9 of more quality of service treatments that the particular network device  
10 may apply to data processed by the particular network device;  
11 based on the device information and the application information, creating and  
12 storing a first policy mapping that associates the traffic flows with the  
13 quality of service treatments; and  
14 creating and storing a second mapping of the application code points to the  
15 quality of service treatments that may be used with the first policy  
16 mapping to generate the quality of service value when the application  
17 program generates traffic flows for one of the message types.  
*B5*

1 30. (New) An apparatus for selectively establishing a quality of service value for a  
2 particular network device in a network that comprises a plurality of other heterogeneous  
3 network devices, comprising:  
4 a network interface that is communicatively coupled to the network for receiving packet  
5 flows therefrom;  
6 one or more processors; and  
7 a computer-readable medium carrying one or more sequences of instructions which,  
8 when executed by the one or more processors, cause the one or more processors  
9 to selectively establish a quality of service value for a particular network device in  
10 a network that comprises a plurality of other heterogeneous network devices, by  
11 carrying out the methods and steps of any of Claims 1, 2, 3, 4, 6, 7, 8, 9, 10, 11,  
12 12, 13, 14, 15, 16, 17, 18, 19, 20, or 29.